

Remarks

The claims have been amended using the revised format that was published in the Official Gazette notice of February 25, 2003. Claim 1 has been amended to incorporate the limitations of dependent claims 2 and 5, and claims 2 and 5 have been accordingly canceled. Support for the amendment of claim 1 can be found in the specification on lines 14-18 and lines 26-29 of page 8.

In the Final Action of January 15, 2003, it was indicated that the pending claims were unpatentable for obviousness under 35 USC 103(a). Claims 1-3, 5-10 and 13-15 were unpatentable over Cunningham et al. (US 5,679,116) with Udelhofen et al. (US 4,231,759) as an evidentiary reference since Cunningham incorporated Udelhofen by reference. Claims 11 and 12 were unpatentable over Cunningham in view of Malfer et al. (US 5,725,612). Claims 1-3 and 5-15 were unpatentable over Malfer in view of Aiello et al. (US 5,006,130).

Cunningham et al. disclose a fuel additive composition useful in controlling deposits that includes a) a detergent or mixture of detergents selected from a derivative of a dicarboxylic acid or anhydride, an aliphatic hydrocarbon-substituted polyamine, and a Mannich condensation product, b) a cyclopentadienyl transition metal complex, and c) a liquid carrier such as a polyoxyalkylene compound. Cunningham et al. teach in detail the effectiveness of combining a detergent, the transition metal complex and a carrier fluid in controlling deposits, but are silent on the combining of detergents beyond disclosing that a mixture of the detergents can be used.

Udelhofen et al. disclose a Mannich condensation reaction product to provide detergency in a liquid hydrocarbon fuel and the combination of the Mannich condensation reaction product and a carrier fluid where intake valve cleanliness is desired per lines 31-35 of column 3.

Malfer et al. disclose a Mannich condensation product that can be prepared from a vinylidene-containing polyisobutylene, a substituted hydroxy-aromatic compound such as ortho-cresol, and a polyamine having only one primary or secondary amino group. The Mannich condensation product of Malfer is used in combination with a carrier fluid in gasoline to reduce intake valve deposits. Malfer et al. disclose that ancillary detergents can be used with the Mannich product and carrier fluid.

Aiello et al. disclose the combination of an aliphatic alkylene polyamine containing an olefin polymer chain and a carrier fluid for use in gasoline to reduce intake valve deposits.

The present invention as claimed in currently amended claim 1 involves a fuel composition comprising a hydrocarbon fuel, a combination of detergents that are a Mannich reaction product and a hydrocarbyl-substituted polyamine, and optionally a fluidizer, also known as a carrier fluid, where the weight ratio of the Mannich to the polyamine is 0.5:1 to 1:0.5, each detergent is present at about 20-100 ppm by weight, and the combination of the detergents is present at or greater than about 60 ppm by weight. This invention is, as was indicated on lines 14-18 of page 2 of the application, unexpectedly much more effective and efficient in controlling fuel system deposits such as intake valve deposits compared to a fuel containing a single Mannich or polyamine detergent and a carrier fluid or fluidizer. The data on page 11 of the application demonstrate this unexpectedly much improved deposit control performance. The fuel compositions of Examples 4, 5 and 8 fall within the scope of currently amended claim 1 and are clearly much better in controlling or reducing intake valve deposits compared to the fuel compositions of Examples 1-3 and 6-7 which contain a single Mannich or polyamine detergent and a fluidizer.

The Cunningham, Udelhofen, Malfer and Aiello references taken individually or in combination teach a fuel composition containing a single Mannich or polyamine detergent and a carrier fluid for controlling deposits. Although these references individually or in combination suggest combining a Mannich and a polyamine detergent, they do not disclose or suggest the unexpectedly much improved performance of the combined Mannich and polyamine detergents of the present invention as claimed in currently amended claim 1.

Based on the amended claims and above remarks, applicants respectfully submit that the pending claims 1, 3 and 6-15 are patentable over the cited references.

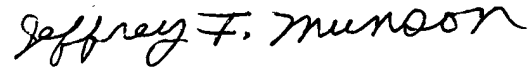
From the foregoing amendments and remarks, it is submitted that the present claims are in condition for allowance and that the reply to the Final Action is fully responsive. An early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the undersigned is suggested.

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Any deficiency or overpayment in fees for this application can be charged or credited to
Deposit Account No. 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

THE LUBRIZOL CORPORATION

A handwritten signature in cursive script that reads "Jeffrey F. Munson". A long, sweeping horizontal line extends from the end of the signature to the right.

Jeffrey F. Munson
Registration No. 45,705

29400 Lakeland Blvd.
Wickliffe, OH 44092-2298
Telephone: (440) 347-5028
Fax: (440) 347-1110